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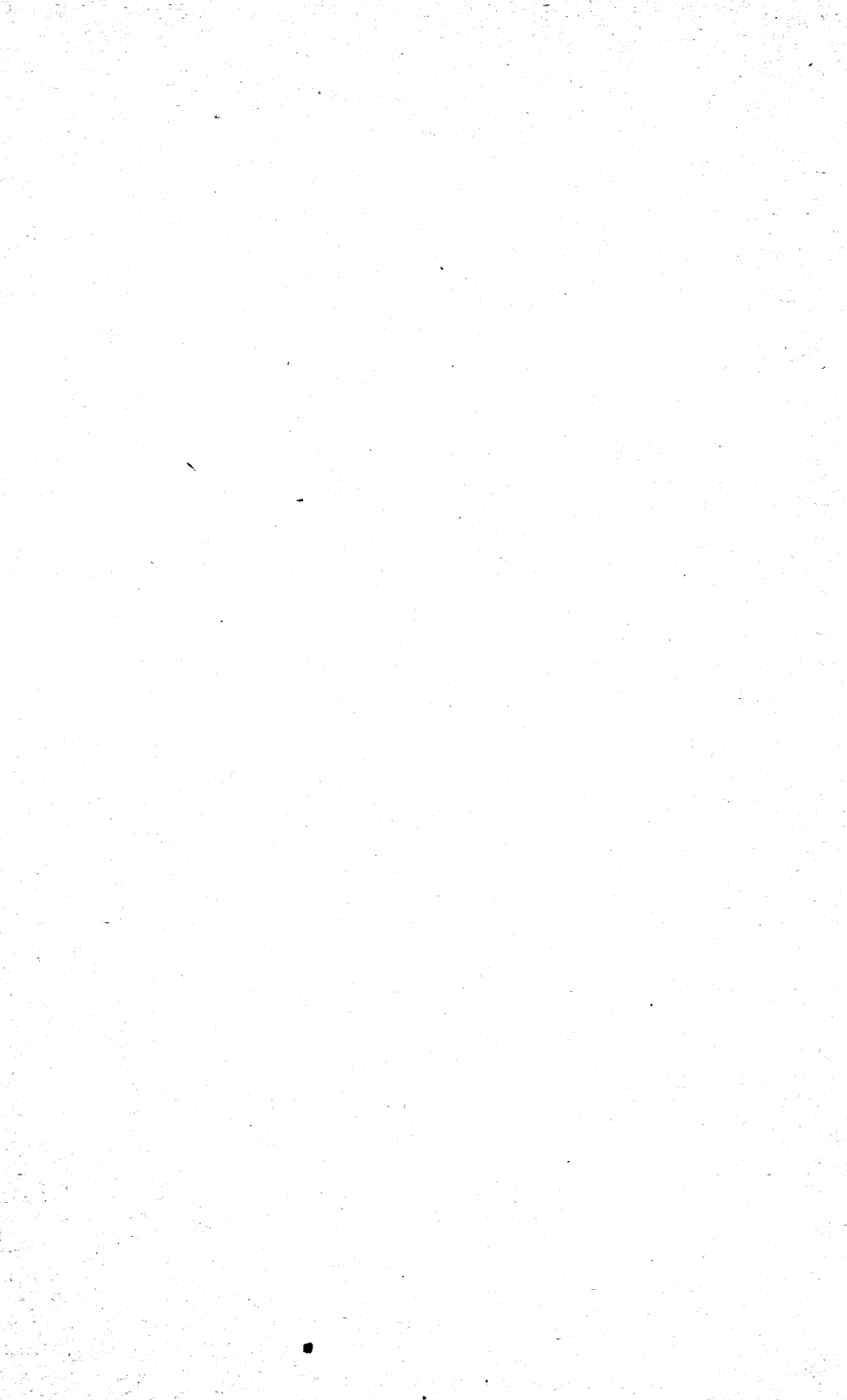
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Hawaii Foreign Office
Coffee; the coming
staple product

University of Michigan



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U.S. GEOLOGICAL SURVEY

COFFEE

AND OTHER AGRICULTURAL
RESOURCES IN

THE HAWAIIAN ISLANDS.



THE HAWAIIAN ISLANDS

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THEIR RESOURCES AGRICULTURAL,
COMMERCIAL AND FINANCIAL.

COFFEE

THE COMING STAPLE PRODUCT.

ISSUED UNDER THE AUSPICES

Hawaiian Islands. OF THE
DEPARTMENT OF FOREIGN AFFAIRS,

1896.

WASHINGTON, D. C. :
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1897.

The following pamphlet has been compiled for the purpose of giving information to those intending to invest in the industries of the Hawaiian Islands. The information can be vouched for as correct. The portion dealing with agriculture is from the pen of Joseph Marsden, Esq., Commissioner of Agriculture. The digest of the land law has been prepared by J. F. Brown, Esq., Commissioner of Public Lands. The pamphlet has been planned, edited and in part written by Alatau T. Atkinson, Esq., ex-Inspector General of Schools, and now General Superintendent of Census.

CHAPTER I.

GENERAL INFORMATION.

The Hawaiian Islands are situated in the North Pacific Ocean and lie between longitudes $154^{\circ} 40'$ and $160^{\circ} 30'$ West, and latitudes $22^{\circ} 16'$ and $18^{\circ} 55'$ North. They are thus on the very edge of the tropics, but their position in mid-ocean and the prevalence of the northeast trade wind gives them a climate unequalled by any other portion of the globe—a perpetual summer without an enervating heat. In the Hawaiian Islands Americans and Europeans can and do work in the open air, at all seasons of the year, as they cannot in countries lying in the same latitudes elsewhere. To note an instance, Calcutta lies a little to the north of the latitude of Kauai, our most northerly island, and in Calcutta the American or European can only work with his brain; hard physical labor he cannot do and live. On the Hawaiian Islands he can work and thrive.

RAINFALL AND TEMPERATURE.

The rainfall varies, being greater on the windward side of the Islands, and increasing up to a certain elevation. Thus, at Olaa, on the Island of Hawaii, windward side and elevation of about 2,000 feet, the rainfall from July 1st, 1894, to June 30, 1895, was 176.82 inches, while at Kailua, on the leeward side, at a low level, it was only 51.21 inches during the same period.

The temperature also varies according to elevation and position. On the Island of Hawaii you can get any climate from the heat of summer to actual winter at the summits of the two great mountains. A meteorological record, kept carefully for a period of twelve years, gives 89° as the highest and 54° as the lowest temperature recorded, or a mean temperature of $71^{\circ} 30'$ for the year. A case of sunstroke has never been known. People take no special precautions against the sun, wearing straw and soft felt hats similar to those worn in the States during the summer months.

WINDS.

The prevailing winds, as mentioned above, are the northeast trades. These blow for about nine months of the year. The remainder of the period the winds are variable and chiefly from the south. The Islands are outside the cyclone belt, and severe storms accompanied by thunder and lightning are of rare occurrence.

HEALTH.

The Islands possess a healthful climate. There are no virulent fevers such as are encountered on the coast of Africa or in the West India Islands. Epidemics seldom visit the Islands, and when they do they are generally light. A careful system of quarantine guards the Islands now from epidemics from abroad. Such grave diseases as pneumonia and diphtheria are almost unknown. Children thrive wonderfully.

AREA.

For practical purposes—and these lines are written for practical men—there are eight islands in the Hawaiian group. The others are mere rocks, of no value to mankind at present. These eight islands, beginning from the northwest, are named Niihau, Kauai, Oahu, Molokai, Lanai, Kahoolawe, Maui and Hawaii. The area of these islands are as follows:

	Square Miles.
Niihau.....	97
Kauai	590
Oahu.....	600
Molokai	270
Maui.....	760
Lanai	150
Kahoolawe.....	63
Hawaii	4210
Total.....	6740

The islands that interest an intending immigrant are Hawaii, Maui, Oahu, and Kauai. It is on these islands that coffee, fruits, potatoes, corn, and vegetables can be raised by the small investor, and where land can be obtained on reasonable terms.

HAWAII.

The Island of Hawaii is the largest in the group, and presents great varieties of soil and climate. The windward side, which includes the districts of North Kohala, Hamakua, Hilo, and Puna, is copiously watered by rains, and in the Hilo district the streams rush impetuously down every gulch or ravine. The leeward side of the island, including South Kohala, North and South Kona, and Kau, is not exposed to such strong rains, but an ample supply of water falls in the rain belt. The Kona district has given the coffee product a name in the markets of the world.

On this island are now situated numerous sugar plantations. Coffee employs the industry of several hundred owners, ranging from the man with 200,000 trees to him who has only an acre or so. There are thousands upon thousands of acres at present uncultivated, and only awaiting the sturdy arms and enterprising brains of the men of the temperate zone to develop them.

MAUI.

Maui is also a very fine island. Besides its sugar plantations, it has numerous coffee lands, especially in the eastern part, which are just now being opened up. The western slopes of Haleakala, the main mountain of Maui, are covered with small farms where are raised potatoes, corn, beans, and pigs. Again, here, thousands of acres are lying fallow.

HONOLULU.

On Oahu is the capital, Honolulu. It is a city numbering thirty thousand inhabitants, and is pleasantly situated on the south side of the island.

The city extends a considerable distance up Nuuanu Valley, and has wings extending northwest and southeast. It is a city of foliage. Except in the business blocks, every house stands in its own garden, and some of the houses are wonderfully beautiful.

The city is lighted with electric light; there is a very complete telephone system, and tram cars run at short intervals along the principal streets, and continue out to a sea-bathing resort and public park four miles from the city. There are numerous stores, where all kinds of goods can be obtained. In this particular Honolulu occupies a position ahead of any city of similar size. The public buildings are handsome and commodious. There are numerous churches, schools, a public library of over 10,000 volumes, Y. M. C. A. Hall, Masonic Temple, Odd Fellows' Hall, and Theatre. There is frequent steam communication with San Francisco, once a month with Victoria (British Columbia), and twice a month with New Zealand and the Australian Colonies. Steamers also connect

Honolulu with China and Japan. There are three evening daily papers published in English, one daily morning paper, and two weeklies. Besides these there are papers published in the Hawaiian, Portuguese, Japanese, and Chinese languages, and also monthly magazines in various tongues.

OAHU'S OPPORTUNITIES.

The Island of Oahu presents excellent opportunities for the investor. Acres upon acres of land remain undeveloped among its teeming valleys, the energies and wealth of the population having been devoted to the development of the sugar lands on the larger islands.

A line of railroad has been constructed which at present runs along the coast to a distance of thirty miles from the city. It is proposed to continue this line completely around the island. This railroad opens up rich coffee and farming lands and affords ready means of transport for the produce, and an expeditious method for obtaining the necessary supplies, etc., from the capital. The management of the railroad offers special inducements for would-be investors to see the country, and special rates should they conclude to settle.

KAUAI.

Kauai is called the "Garden Island," it is so well watered and so luxuriant in vegetation. The island is at present largely devoted to the cultivation of sugar. Rice also cuts a considerable figure in the agricultural production of Kauai. That it can produce coffee is undoubted, but there is a timidity about embarking in the industry, because some forty years ago the experiment of a coffee plantation was tried, and owing to misjudgment of location and soil, failed. Since then the cultivation of coffee has come to be more thoroughly understood, and there is no doubt that quantities of land suitable for such cultivation are now lying, like the sleeping beauty, waiting for the kiss of enterprise to make them awake into usefulness and profit for mankind.

There is room on the Hawaiian Islands for at least ten times the present population. The climate, soil, and social conditions all tend to make them a desirable home for those who are willing to work and who have a moderate capital to begin with.

GOVERNMENT.

The Government of the Hawaiian Islands is a republic. Up to the year 1893 it had been a limited monarchy, but at that date it was felt, by the progressive party in the state, that monarchy had had its day, and that the friends of such a form of government should give way to more liberal institutions, assimilating to the institutions of the United States, and to become a part of which great republic is the earnest desire of all those who have the interests of the Islands at heart. The monarchy, in a bloodless revolution, disappeared and the Republic took its place.

The Republic is a republic of progress, and under the Government thus established every facility has been given for developing and improving the country. The President is elected for six years. The Legislature consists of a Senate and House of Representatives, all members being elected by popular vote. The Senators are elected for a term of six years, and voters for Senators must have real property worth \$1,500, or personal property worth \$3,000, or an income of not less than \$600 per annum. The vote for Representatives is based on manhood suffrage.

TAXATION.

All males between the ages of 20 and 60 pay a personal tax of \$5, viz: Poll tax, \$1; road tax, \$2; school tax, \$2. Land pays a tax of one per

cent. on the cash value, and personal property a similar rate. Carts pay \$2, brakes \$3, carriages \$5, dogs \$1, female dogs \$3. From the above it will be seen that the taxes are not heavy as compared with other countries; moreover, there are no local taxes of any kind.

METHOD OF ACQUIRING LAND.

Land can be obtained from the Government by two methods, viz.: The cash freehold system, and the right-of-purchase leases. Under the first system the land is sold at auction. The purchaser pays one-quarter in cash and the rest in equal installments of one, two, and three years, interest being charged at the rate of six per cent. upon the unpaid balance. Under this system the purchaser is bound to maintain a home on the land from the commencement of the second year to the end of the third. The right-of-purchase leases are drawn for twenty-one years at a rental of eight per cent. on the appraised value of the land. The lessee has the privilege of purchasing the land, after the third year, *at the original appraised value*, provided 25 per cent. of the land is reduced to cultivation, and other conditions of the lease are fulfilled. In this case a home must be maintained from the end of the first year to the end of the fifth year. The limit of first-class agricultural land obtainable is 100 acres. This amount is increased on lands of inferior quality. Under the above conditions the applicant must be 18 years of age and obtain special letters of denization. Land can also be obtained from the various land and investment companies and from private parties. The full land law is treated of in Chapter VI of this pamphlet.

JUDICIARY, POLICE, ETC.

There is a thoroughly efficient judiciary, consisting of a Supreme Court, five Circuit Courts in which trials by jury are conducted, and District Courts in every district. The higher courts are presided over by well trained, educated men. There is an efficient police force in every part of the group. The inhabitants are law-abiding and crimes of violence are very rare. There is very little petty theft, and even in Honolulu, the greatest center of population and a seaport town, many of the houses are left with doors unlocked at night.

SCHOOLS.

There is an excellent system of free public schools taught in the English language, the teachers in many cases being imported from the United States. The main plan of the system is modelled upon the public school system of the United States, modified to meet the wants of a heterogeneous population. The children are instructed in writing, reading, composition, arithmetic, geography, both local and general. The books are uniform and obtainable at the same price as in the United States. The schools are strictly non-sectarian. There is no district, however remote, in which there is no school. The only people who cannot read and write are those who come from abroad. Those born in the Islands are compelled by law to take advantage of the education offered. Besides the common-school education, opportunities are given at various centers for a higher education equivalent to the grammar grade of the United States, and in Honolulu a high school and collegiate course can be obtained at a small cost.

CHURCHES.

The various Christian denominations are represented and all forms are tolerated. The country churches of the Protestant denominations are chiefly conducted by Hawaiian pastors, the Roman Catholic by French and German priests, who are mostly good linguists and speak Hawaiian,

English, and Portuguese, besides their mother tongue. Wherever there is a large collection of English-speaking people a Protestant church is usually supported by them. In Honolulu there is a large number of churches, Congregational, Roman Catholic, Episcopalian, Methodist, and Mormon. There is a Sunday law, and all work which is not absolutely necessary is prohibited on that day. Rational outdoor amusement is not prohibited, such as riding, boating, shooting, etc., and the Government Band plays at the public park at Waikiki every Sunday afternoon.

PHYSICIANS.

In every district of the Islands the Government supports a doctor, who gives his services to indigent Hawaiians free of charge; others have to pay. In many places there are physicians settled who carry on a private practice.

TELEPHONES.

The Islands of Oahu, Kauai, and Hawaii have telephones to every accessible point. The rent of the instrument is moderate, and a small charge is made for those who do not care or cannot afford to possess an instrument of their own. On Maui the telephone is at present established only in part.

COMMUNICATION BETWEEN THE ISLANDS.

Communication between the Islands is by steamer; of these some seventeen are constantly plying from port to port, affording weekly communication with the capital. The regular passenger steamers are well fitted with cabins, have electric bells and electric lights and all modern accommodations.

POSTAL MATTERS.

There is a regular postal system, and on the arrival of a steamer at any main point, mail carriers at once start out to distribute the mail through the district. The Hawaiian Islands belong to the Postal Union, and money orders can be obtained to the United States, Canada, Great Britain, Germany, Norway, Sweden, Denmark, the Netherlands, Portugal, Hong Kong, and Colony of Victoria, as well as local orders between the Islands.

CHAPTER II.

AGRICULTURAL INDUSTRIES.

The mainstay of the Hawaiian Islands has, for the last thirty-five years, been the sugar industry. From this source a large amount of wealth has been accumulated. But the sugar industry requires large capital for expensive machinery, and has never proved remunerative to small investors. An attempt has been made at profit-sharing and has met with some success, the small farmer cultivating and the capitalist grinding at a central mill. Of late years, moreover, the small farmer has been steadily developing in the Hawaiian Islands, and attention has been given to other products than sugar.

Rice, neither Europeans nor Americans can cultivate as laborers. It requires working in marshy land, and though on the Islands it yields two crops a year, none but Chinamen can raise it successfully. A dry-land or mountain rice has been introduced, which will be treated under the head of Agricultural possibilities.

The main staple after sugar and rice is coffee. Of this, hundreds of thousands of trees have been planted out within the last five years. This

is essentially the crop of the future and bids fair to become as important a staple as sugar. Coffee does not require the amount of capital that sugar does, and it can be worked remuneratively upon a small area. It is estimated that at the end of the fourth year the return from a 75-acre coffee plantation will much more than pay the running expenses, while from that time on a return of from eight to ten thousand dollars per annum may be realized.

On page 18 will be found an estimate of the cost of establishing a 75-acre coffee plantation from the first to the seventh year.

Fruits can also be cultivated to advantage. At present the banana trade of the islands amounts to over 100,000 bunches per annum, valued at over \$100,000, and the quantity might be very easily quadrupled. The banana industry may be regarded as in its infancy. The export of the fruit is only from the Island of Oahu, but there are thousands of acres on the other islands of the group which could be profitably used for this cultivation and for nothing else. The whole question of the banana industry hinges on the market. At present the market is limited.

Limes and oranges can be cultivated and the fruit can be easily packed for export; at present the production does not meet the local market. The fruits can be raised to perfection. The Hawaiian orange has a fine flavor and the Hawaiian lime has an aroma and flavor far superior to that cultivated in Mexico and Central America. In the uplands of Hawaii and Maui potatoes can be and are raised. Their quality is good. Corn is also raised. In these industries many Portuguese, Norwegians, and others have embarked. Both these products find an ample local market. The corn is used largely for feed on the plantations. The corn is ground with the cob and makes an excellent feed for working cattle, horses, and mules.

In the uplands, where the climate is temperate, as at Waimea, Hawaii, vegetables of all kinds can be raised; excellent cauliflowers, cabbages, and every product of the temperate zone can be grown to perfection.

Cattle raising in so small a place as the Hawaiian Islands does not present great opportunities except for local consumption. Pigs are profitable to the small farmer. In the Kula district of Maui pigs are fattened upon the corn and potatoes raised in the district. The price of pork, dressed, is 25 cents per pound in Honolulu and about 15 cents per pound in the outside districts. The Chinese, of whom there are some 15,000 resident on the various islands, are extremely fond of pork, so that there is a large local market, which has to be supplemented by importations from California.

Attention has lately been given to fibre plants, for which there are many suitable locations. Ramie grows luxuriantly, but the lack of proper decorticating and cleaning machinery has prevented any advance in this cultivation.

Sisal hemp and sansevieiria have been experimented with, but without any distinct influence upon the trade output.

The cultivation of pineapples is a very growing industry. In 1895 pines were exported from the Islands to San Francisco to the value of nearly \$9,000. This has grown up in the last half dozen years. There is every reason to think that canning pineapples for the Coast and other markets can be made profitable.

The guava, which grows wild, can also be put up to profit, for the manufacture of guava jelly. It has never been entered upon on a large scale, but to the thrifty farmer it would add a convenient slice to his income, just as the juice of the maple adds an increase to the farmer of the Eastern States. Well-made guava jelly will find a market anywhere. In

England it is regarded as a great delicacy, being imported from the West India Islands. Besides the guava there are other fruits which can be put up to commercial profit, notably the poha or Cape gooseberry (*Physalis edulis*). This has been successfully made into jams and jelly, which command an extensive local sale and should find their way into larger markets.

In point of fact, outside the great industries of sugar, coffee, and rice, there is a good field for many minor industries which can be carried on with profit by those who know what work is, and are willing to put their shoulders to the wheel.

In the Hawaiian Islands a simple life can be lived, and entering gradually upon the coffee industry, a good competence can be obtained long before such could be realized by the agriculturist elsewhere. However, it is useless to come to the Islands without the necessary capital to develop the land that can be obtained.

Between arriving and the time that the crops begin to give returns there is a period where the living must be close, and cash must be paid out for the necessary improvements. The land is here, the climate is here; it only requires brains, a small capital and energy to realize such comfort and independence as cannot be realized in old countries in one-fourth of the time.

CHAPTER III.

COFFEE.

The most promising of all the Island products, outside of sugar, is coffee. No finer coffee in the world is produced than that of the Hawaiian Islands. It requires care, and does not produce a crop until the third year, but it remains till the fifth year to make a proper realization upon the investment. It is evidently necessary to give a very full description of the coffee plant and its method of culture to assure intending immigrants of what is before them.

Coffee is a shrub belonging to the family of the Rubiacæ. Botanists divide it into many species, but it can be practically divided into two sections, Arabian coffee and Liberian coffee, or in point of fact, Asiatic and African. In the Hawaiian Islands coffee grows best between 500 and 2,600 feet above the sea level, though there are cases in which it has done well close to the sea. It requires a loose, porous soil, and does not thrive well in heavy, clayey ground which holds much water. Of such heavy land there is very little in the Hawaiian Islands. The soil is generally very porous.

It is very evident that coffee will thrive and give good results in varying conditions of soil and degrees of heat. In these Islands it grows and produces from very nearly at the sea level to the elevation of 2,600 feet. The highest elevation of bearing coffee known here is twenty-five miles from the town of Hilo and in the celebrated Olaa district.

With such a range it is evident that, in a tropical climate, the cultivation of coffee presents greater opportunities for an investor than other tropical products.

For years it was thought that coffee would only grow to advantage in the Kona district of Hawaii. Practical experiment has shown that it can be grown with success in almost any part of the Islands.

The opening up of the Olaa portion of the Puna district by a well macadamized road leading from Hilo to the Volcano may be regarded as

the commencement of the coffee industry on a large scale on the Hawaiian Islands. There are now over fifty plantations where six years ago there was nothing but tangled and dense forest. The Olaa land is Government property and can be acquired under the land law. There are still 10,000 acres not taken up. The location is very desirable, as there is direct communication with Hilo by an excellent road and the crop can be readily taken to the shipping point. Indeed it cannot be long before a railroad will be built; when this takes place a far larger extent of land will be available for coffee-growing in this section of the country. The soil in the Olaa district is deep and wonderfully prolific.

Other portions of Puna also present many fertile lands, and coffee plantations in those parts are coming to the front, showing excellent results. A considerable number of investors have opened up coffee plantations in them, all of which are doing excellently. These plantations, to the knowledge of the writer, are, many of them, carried on out of the savings made by workers in Honolulu, who are thus preparing for themselves a provision for their early middle age. On the Island of Hawaii are the great coffee districts of Olaa, Puna, Kona, and Hamakua, in each of which thriving coffee plantations are established, while tens of thousands of acres of the very finest lands are yet undisturbed. Government lands in these districts are being opened up for settlement as fast as circumstances will permit.

On the Island of Maui there is a large area of splendid coffee lands.

The extensive land of Keanae belonging to the Government will be opened for settlement as soon as the preliminary work of surveying is completed.

On the Island of Molokai the industry is making progress and there are several plantations along the leeward valleys.

So also on the Island of Oahu there is much good coffee land, which is being experimented upon, and considerable capital invested in the undertaking.

As the case now stands for the investor, land can be obtained for coffee growing in:—

ISLAND OF HAWAII.

North and South Kona,
Hilo,
Puna, including Olaa,
Hamakua.

ISLAND OF MAUI.

Keanae,
Nahiku,
Lahaina,
Kaupo.

ISLAND OF MOLOKAI.

ISLAND OF OAHU.

ISLAND OF KAUAI.

In addition to the large tracts of Government lands on Hawaii and Maui, there are many fine tracts of first-class coffee lands owned or controlled by private parties. It is the policy of the Government to encourage the settlement of its lands by small farmers. Hence the amount of land granted to one party or that one party can take up, while amply sufficient to enable one person or family, with honest endeavor, to acquire an independence, is not large enough to offer inducements for the employment of large amounts of capital.

That areas of land for the establishment of large coffee plantations can be acquired is reasonably certain, as large owners are evincing a disposition to sell and lease their lands.

There is no agricultural investment that offers better opportunities for the profitable employment of capital than a well-managed coffee estate.

CHAPTER IV.

CULTIVATION OF THE COFFEE TREE IN THE HAWAIIAN ISLANDS.

In order to obtain the best results, the coffee tree requires to be properly planted, and during its lifetime needs frequent and intelligent cultivation.

The various operations incidental to the opening and carrying on of a coffee plantation will be taken up in their proper order and described in as plain language as possible, and as briefly as is consistent with a clear explanation of the subject.

The very first thing the planter should do after obtaining possession of his land is to plant a nursery, so that he may have, as soon as possible, an abundant supply of strong, healthy plants. Many planters have planted their fields with wild stumps; these are young coffee plants that are found under wild growths of coffee trees. The young trees are cut off about six inches above the ground; they are then taken up and the lateral roots trimmed close to the tap-root. The thready end of the tap-root is cut off, and the stump is ready to plant. In some cases the young plants are taken up from under the wild trees and planted just as they are. This method can be dismissed at once as the worst possible method of planting the coffee tree. The very best plants are strong, healthy nursery plants—that is, plants that have been grown, from the best seed, in a properly prepared nursery. The next best plants to use are nursery stumps. These are nursery trees that have grown too large to safely transplant. By cutting them down and trimming the roots they can be safely transplanted to the field, where they will grow into good, healthy trees. Stumps soon after planting send up several shoots; these, with the exception of the strongest one, are taken off. This latter shoot is to grow and make the coffee tree.

MAKING THE NURSERY.

The size of the nursery will depend on how large the plantation is to be. For a 75-acre plantation, one acre of ground will more than supply all the plants required. It is always desirable to have a greater number of plants than is needed to just plant the acreage the plantation is to be, for after the fields are planted some of the plants may get injured from dry weather and require replacing with plants from the nursery. Any surplus left after the trees in the fields are well established can be sold to some later planter, who will find it to his advantage to purchase good nursery plants for his first planting and thereby save one year of time. It is advisable for all planters to buy plants for their first planting, but for the second year's planting they should have a nursery of their own from which they can select the strongest and most forward plants.

The land for the nursery should be selected as close as possible to where the plantation is to be. It should be on a slight slope to insure drainage, and free from rocks and stones. The soil should be ploughed or dug over to the depth of one foot and made as fine as possible. Beds should be thrown up six inches high and three feet wide. The surface

of the beds should be made quite smooth and level; the seeds should be planted six inches apart and three-quarters of an inch deep. A good way to ensure even and regular planting is to make a frame three feet wide each way. Pegs, three-quarters of an inch long and five-eighths of an inch diameter, should be fastened to one side of the frame, placing them exactly six inches apart. The frame, thus prepared, is placed, pegs down, on the bed. A slight pressure will sink the pegs into the soil. The frame is now lifted and you have the holes for the seeds all of one depth and equidistant from each other. The seeds can now be dropped, one in each hole. The seeds should be placed flat side down, and covered by brushing over the surface of the bed. If the weather is at all dry it is a good plan to mulch the surface of the bed with dry grass or fern leaves. The soil should be kept moist, and if there is not sufficient rain the beds must be watered. In six or seven weeks the seeds should sprout and show above ground. The mulching should now be moved from over the plants and arranged in the rows. It has been the practice of some planters to plant the seed much closer than six inches apart, but it will be found that plants at six inches apart can be more easily and safely transplanted than from close-planted beds. It will be advisable, in taking up plants from the beds, to take only every other one; this will give the remaining plants more room to develop and grow more stocky than would be the case if all the plants were taken up from each bed as they were required.

CLEARING THE LAND.

The next thing for the planter to do is to get his land cleared. This can be done more satisfactorily and cheaply by contract than can be done by day's work. Gangs of Chinese and Japanese undertake the clearing of land and will make a contract to clear the land as per specification. In the Olaa district land costs from \$20 to \$50 per acre to clear, according to the kind of clearing done. The land is forest land and some planters have the trees cut down and everything burned, making the land quite clear, while others just have the vines and ferns cut and the trees felled, leaving everything on the land to rot. This method, while costing much less than burning up everything, makes it more expensive to lay out and plant the land. The planter must decide for himself which of the two methods he will pursue. However, it can be said in the case of those who only cut and fell, in a few years everything, trees, vines, and ferns, rot down and greatly increase the fertility of the soil. The next thing is to lay out the land for the digging of the holes where it is intended to set out the young trees. There is a wide diversity of opinion as to the proper distance apart to plant coffee trees. From 10 x 12 feet down to 5 x 6 and all intermediate distances are practiced. It is a significant fact that planters who formerly planted their trees at the wider distances are now setting out trees as close as 6 x 5. Trees planted 6 x 6 will probably yield better results per acre than trees planted at a wider or closer distance. Having fixed upon the distance apart the trees are to be planted, the planter proceeds to mark with pegs the places where he wants the holes dug. This is usually done with a line or rope that has pieces of red rag fastened in the strands, at the distance apart at which it is intended to dig the holes. The line is drawn tightly across one end of the clearing and a peg driven into the soil at every place that is marked on the line. The men holding the two ends of the line are each provided with a stick the exact length that the rows are to be apart. After one row is pegged, the line is advanced one length of the stick and the operation repeated until the

whole clearing is pegged. After the first line is pegged, a line should be laid at exactly right angles to the first line so that the rows will be straight both ways. The pegging being completed, the holes should be dug not less than 18 inches wide and 18 inches deep. The top-soil should be carefully placed on one side of the hole and the subsoil on the other; the holes should remain open as long as possible and should only be filled in a week or so before planting the trees. The bottoms of the holes should be explored with a light crowbar, and if any rocks or stones are found, they should be removed. In filling the holes the top-soil (that has been placed on one side) should be placed in the bottom of the hole and other top-soil should be taken from between the rows until the hole is full; the subsoil can now be disposed of by scattering it between the rows. The holes, after filling, should have the marking pegs replaced in the center of the filling; this will serve as a guide for planting the trees.

PLANTING.

There is no operation in all the work of establishing a coffee plantation that requires such careful supervision as that of planting out the young trees. If the work is carelessly done and the slender tap-root is doubled up, or if it is shortened too much, the tree will never thrive. It may grow fairly well for a time, perhaps until the time for the first crop, then the foliage will turn yellow and the tree show every sign of decay. The effort to produce a crop is too much for the tree, and the sooner it is pulled up and replaced by a properly planted tree the better.

The closest supervision is necessary in order that the planter may be certain that the tap-roots are placed perfectly straight in the ground, and the lateral roots placed in a natural position. In order to effect this with the least amount of trouble, transplanters have been used. A transplanter that has been used with success is made as follows: two pieces of sheet iron (galvanized) are bent into two half circles, which when placed together form a cylinder 3 inches in diameter and 7 inches long. A piece of hoop iron is bent to a ring, that will fit over the cylinder, and riveted. The mode of using is as follows: The two halves of the cylinder are pressed into the ground, one on each side of the young coffee tree. They are pressed down until the upper ends are level with the surface of the soil. The hoop-iron ring is then pressed over the ends of the two halves of the cylinder, binding them firmly together. The cylinder can now be lifted from the ground, bringing with it the young tree with all its roots in the position in which they grew. In this condition the young trees are carried to the field and, the holes being opened, the cylinder, holding the tree, is placed in the ground and the soil packed firmly around it. The hoop-iron ring is then removed and the two halves of the cylinder withdrawn. The soil is again compacted around the roots and the tree is planted. There is another transplanter, invented in America, that would probably be better and more economical in working than the one described above. This transplanter consists of a cylinder of thin sheet steel. These are made in America of various sizes to suit different kinds of trees. For a coffee tree a good size would be 7 inches long and 5 inches in diameter. The cylinder has an opening, five-eighths of an inch wide, running the whole length of the cylinder, and exactly opposite this opening a handle is riveted. This handle is of half-inch round iron, 18 inches long, with a cross-bar on top. The rod is bent outward in the form of a bow, so that, in working, the branches of the young tree may not be injured. The mode of working the transplanter is as follows: the cylinder is placed on the ground with the tree in the center of the cylinder. This

can be done by allowing the stem of the young tree to pass through the slot in the cylinder. Then, by means of the cross-handle, the cylinder is turned and pressed into the soil until the upper end is level with the surface of the ground. Then, by lifting on the stem of the tree and the handle of the transplanter at the same time, the tree is taken from the ground with its roots undisturbed. Should the end of the tap-root project below the end of the cylinder, the thready end should be pinched off with the thumb nail. By placing the lower end of the cylinder on the bottom of a box and inserting a wedge-shaped piece of wood in the slot, the cylinder is sprung open and can be withdrawn, leaving the young tree, with a cylinder of earth around its roots, standing on the bottom of the box. This operation can be repeated until the box is full of the young trees, when it is carried to the field and the trees placed one at each hole. By using a duplicate transplanter a cylinder of earth is removed from the spot where the tree is to be placed, and the tree with its cylinder of earth is placed in the round hole, which it exactly fits, the earth being slightly compacted around the roots. The tree is thus planted with the absolute certainty that the roots are in their natural position.

WEEDING.

The old adage, "a stitch in time saves nine," will bear its fullest application in the care and weeding of a coffee estate. From the time the land is first cleared, weeding should commence, and it is astonishing how little it will cost if care is taken that no weed be allowed to run to seed. The bulk of Hawaiian coffee lands is situated in the forests where the land is covered with a dense undergrowth of ferns and vines and there are no pernicious weeds to bother. But, soon after clearing, the seeds of weeds are dropped by the birds and are carried in on the feet and clothing of the laborers and visitors. We have no weeds that run to seed in less than thirty days, and if the fields are gone over once a month, and any weed that can be found pulled up and burned, the work of weeding will be reduced to a minimum. But if the weeds, that are bound to spring up, are allowed to run to seed, the work of weeding will be greatly increased and will require the labor of a large gang to keep the fields in order. If taken in time, the labor of one man will keep from 15 to 25 acres quite clean. During the first year after setting out the fields, all that is required is to keep the fields clear of weeds, and the replacing, with a healthy tree from the nursery, any tree that from any cause looks sickly and does not come along well.

It will be found that in parts of the field some trees, while looking healthy, do not grow as fast as the average of the trees; this is often due to the soil not being of as good a quality. Knolls and side hills are not generally so rich as the hollows and valleys, and the coffee trees planted in the poorest parts of the field should be fertilized until they are as vigorous as the trees in the best parts.

HANDLING.

During the second year the young trees will have begun to make a good growth, and will require handling. In order to make clear the description of the operations of handling and pruning, it may be well to describe here the component parts of the coffee tree.

The underground portion consists of a tap-root and numerous lateral or side roots. The parts above ground consist of:

1st. The stem or trunk.

2d. The primaries or first branches; these grow from the trunk in pairs at intervals of from two to four inches; the two primaries, making

a pair, grow one opposite to the other, the pair above radiating out at a different angle, and so on to the top of the tree.

3d. The secondaries; these are the branches that grow in pairs from the primaries.

4th. The tertiaries; these are the third branches that grow in pairs from the secondaries in the same manner as the secondaries grow on the primaries.

5th. The leaves that grow on all the branches.

During the whole of the second year the field should be gone over at least every two months, and all the secondaries that make their appearance should be rubbed off; this can be done by a touch of the fingers, if the secondaries are not more than two or three inches long. If allowed to grow longer, the knife must be used or there is danger of tearing out the eye or bud, which we depend upon for growing new secondaries at the proper time. During the second year the secondaries will make their appearance only on the lower sets of primaries, the upper sets as they grow being too young to grow secondaries. At the beginning of the third year all the secondaries should be allowed to grow till they attain a length of six inches; then the trees should be carefully gone over, and all but five of the secondaries on each primary cut off with a sharp pruning knife. No pairs should be left, and only the strongest and most vigorous should be retained. They should be disposed on alternate sides of the primary and none left in a space of six inches from the stem of the tree. The object of this is to allow the light to penetrate to the center of the tree, for the coffee tree bears fruit in greater profusion on branches that are exposed to the light than on those that are shaded.

During this third year the tree will blossom and bear the first or maiden crop. In some cases the tree will blossom in the second year, but it is a wise plan to rub all the blossoms off, as it only weakens the tree to bear a crop at such an early age. It is of the utmost importance that in the first crop, as well as in all future crops, the tree should not be overburdened with a superabundance of growing wood. If left to itself, the lower primaries will grow a mass of secondaries, so much so that no blossom will set on them, and the first crop will come only on the upper primaries, and be only a third or fourth of the crop that would be produced if the trees were properly handled. By handling as described above, the tree is relieved of all superfluous wood, and only such secondaries are left as are needed to bear the fourth year's crop, and the maiden crop will grow on the primaries. It may be well to mention here that coffee only grows on wood of the second year's growth, and does not grow on the same wood twice.

During the third year the secondaries will come on the upper primaries. When they are well set they should be reduced in number, and in no case should more than five be left to grow. In some cases four or even three will be sufficient. Whatever the number that may be left, it must be understood that these are the branches that will bear the crop for the fourth year. During the third year new secondaries will grow from the places where the former secondaries grew. Sometimes two will grow from one bud; they should all be removed, the trees being gone over every two months; but at the last handling before blossoming time, which varies greatly with the elevation above sea level, enough of these new secondaries should be left to make wood for the fifth year's crop. From this time on the coffee planter should be able to point out the wood on which the present and the next year's crop will be borne, and it is this wood, and that only, that should be allowed to grow. All other shoots, suckers, etc., should be

rubbed off each time the tree is handled, provision being made each year for the wood for the crop two years hence.

During the third year the trees will require topping. As to the height at which a coffee tree should be topped, there is a great diversity of opinion. Some planters advocate topping as low as four and a half feet, others at six or seven feet. As a matter of fact, the coffee tree will bear fruit if topped as low as one and one-half feet, or if not topped at all. The only valid reason for topping as low as four and a half feet is for the convenience of picking the crop. Five and a half or six feet is a good height to top a coffee tree on the rich lands of the Hawaiian Islands. In fact the planter should not be guided by the number of feet, but by the number of primaries he desires the tree to carry. Eighteen to twenty pairs are a reasonable number for a coffee tree to carry in this country, and it will be found that by not counting those primaries that grow on the stem within fifteen inches from the ground eighteen or twenty pairs of primaries will come on the stem within six feet from the ground. Before topping the tree it should be allowed to grow somewhat higher than it is intended to top, so that the wood may be hardened and not decay, as it sometimes does if topped when the wood is too young. Topping is performed by cutting off the top of the tree at a point an inch above a pair of primaries. Both primaries should also be cut off an inch from the stem. This will leave the top in the form of a cross; a knot will form at this point, from which the tree will constantly send up shoots, striving to make a new top. These should be torn off every time the tree is handled.

We have now arrived at the time when the tree is bearing the first or maiden crop. Through careful handling the tree has been divested of all superfluous shoots, branches, etc., and the crop is maturing on the primaries. If the trees are situated on good, rich soil, and the trees are well grown, there should be at least thirteen pairs of primaries bearing crop. At an average of fifty berries to each primary, there will be a yield of over one and a quarter pounds of clean coffee to the tree. This yield for the first crop has been much exceeded in this country, but it can only be assured by careful cultivation and handling, as described in this paper.

We will now take a look at the condition of our three-year-old trees. They have all been topped, and are carrying from thirty-six to forty primaries, of which all except the upper six or eight are carrying four or five secondaries that are well advanced, and which will bear the crop for the fourth year. There will also be four or five secondaries, that are one or two months old, which are intended to bear the fifth year's crop. All other growth should be removed as before up to the time of blossoming for the fourth year's crop. This may be estimated as follows: There should be at least twenty-four primaries that have on each of them, say, four bearing secondaries. At thirty berries to each secondary, the yield would be close to three pounds of clean coffee to each tree. This, again, has been exceeded in this country for four-year-old trees, but it must be borne in mind that, in order to obtain these results, proper cultivation, handling and pruning must be done. Without proper care such results would be impossible; the coffee cannot grow an abundance of wood and coffee at the same time. As soon as the crop of the fourth year is gathered, the work of pruning must commence without delay. This consists of cutting off with a sharp knife the secondaries that have borne the crop. They must not be cut so close as to injure the eye or bud. About three-sixteenths of an inch from the stem of the primary will be quite safe, and the secondaries for the fifth year's crop will soon make their appearance. Care should be taken to leave the stem of the tree clear of shoots and

foliage for a space of six inches from the stem; the tree will want all the light it can get. The coffee tree can be said to be in full bearing when all the primaries are carrying bearing secondaries. During the life of the coffee tree, the planter must keep a close watch on his trees and restrict their wood-bearing propensities to the wood that is to bear his crops; nothing else should be allowed to grow. If the work is commenced rightly and carried on systematically, the work will not be difficult and no crops will be lost. But, on the other hand, if the work is neglected, the trees will become matted and all the lower primaries die off. These, if once lost, will not grow again. The tree under these conditions will only bear a tithe of the crop it would bear with proper attention, and, furthermore, it is a most difficult matter to bring a neglected tree into proper shape, and it can only be done at a loss of one, and perhaps two, years' time. There are many minor details connected with the care of the coffee tree which would occupy too much space to describe here, and which the coffee planter can easily learn as he carries on the work of coffee planting. Without doubt, coffee planting in this country is destined to become a great industry. We have large tracts of the finest coffee lands in the world, only waiting to be cultivated to make prosperous and happy homes. One parting word to the intending coffee planter: take Davie Crockett's motto, "Be sure you're right, and then go ahead."

ESTIMATE OF COST OF ESTABLISHING AND MAINTAINING A COFFEE PLANTATION
OF 75 ACRES, FROM THE FIRST TO THE SEVENTH YEAR.

First Year.

Purchase of 100 acres of Government land at \$10.00 per acre.....	\$1,000 00	
Manager's house and water tank.....	600 00	
Laborers' quarters and water tank.....	350 00	
Clearing 50 acres of land, at \$20 per acre.....	1,000 00	
Fencing.....	300 00	
Purchase of 65,000 1-year-old coffee plants at \$5 per M.....	325 00	
Lining, holing, and planting 50 acres.....	600 00	
Manager's salary, 1 year.....	1,200 00	
Labor of 6 Japanese, 1 year at \$15 per month..	1,080 00	
Purchase of tools and starting nursery.....	500 00	
	<hr/>	
	\$6,955 00	\$6,955 00

Second Year.

Manager's salary.....	\$1,200 00	
Labor, 6 Japanese.....	1,080 00	
Extra labor lining, holing, and planting 25 acres	300 00	
Sundries.....	500 00	
	<hr/>	
	\$3,080 00	3,080 00
		<hr/>
Carried forward.....		\$10,035 00

Third Year.

Brought forward.....		\$10,035 00
Manager's salary.....	\$1,200 00	
Labor, 9 Japanese.....	1,620 00	
Pulping shed and drying house.....	500 00	
Pulper, with engine and boiler.....	500 00	
Extra help for picking, pulping, and drying 20,000 lbs. of coffee from 50 acres (at 4 cents per lb.).....	800 00	
Hulling, polishing, and grading 20,000 lbs. of coffee at 1 cent.....	200 00.	
Sundries: bags, freight, etc.....	250 00	
	<hr/>	
	\$5,070 00	5,070 00
		<hr/>
		\$15,105 00

Credit.

By sale of 20,000 lbs. of coffee at 18 cents.....	3,600 00
	<hr/>
	\$11,505 00

Fourth Year.

Manager's salary.....	\$1,200 00	
Labor, 9 Japanese.....	1,620 00	
Extra labor picking, pulping, and drying 50,000 lbs. of coffee from 50 acres (at 4 cents per lb.).	2,000 00	
10,000 lbs. from 25 acres (3-year-old trees).....	400 00	
Hulling, polishing, and grading 60,000 lbs. at 1 cent.....	600 00	
Sundries: bags, freight, etc.....	400 00	
	<hr/>	
	\$6,220 00	6,220 00
		<hr/>
		\$17,725 00

Credit.

By sale of 60,000 lbs. of coffee at 18c.....	10,800 00
	<hr/>
	\$6,925 00

Fifth Year.

Manager's salary.....	\$1,200 00	
Labor, 9 Japanese.....	1,620 00	
Picking, pulping, and drying 60,000 lbs. coffee from 50 acres and 25,000 lbs. from 25 acres, at 4 cents.....	3,400 00	
Hulling, polishing, and grading 85,000 lbs. at 1 cent per lb.....	850 00	
Sundries: bags, freight, etc.....	500 00	
	<hr/>	
	\$7,570 00	7,570 00
		<hr/>
Carried forward		\$14,495 00

Brought forward.....		\$14,495 00
<i>Credit.</i>		
By sale of 85,000 lbs. coffee at 18 cents.....		15,300 00
Balance on hand.....		<u>\$905 00</u>
<i>Sixth Year.</i>		
Manager's salary.....	\$1,200 00	
Labor, 9 Japanese.....	1,620 00	
Picking, pulping, and drying 75,000 lbs. of coffee from 50 acres and 25,000 lbs. from 25 acres, 100,000 lbs. at 4 cents.....	4,000 00	
Hulling, polishing, and grading 100,000 lbs. at 1 cent.....	1,000 00	
Sundries: bags, freight, etc.....	1,000 00	
	<u>\$8,820 000</u>	8,820 00
		<u>\$7,915 00</u>
<i>Credit.</i>		
By sale of 100,000 lbs. of coffee at 18 cents.....		18,000 00
Balance on hand.....		<u>\$10,085 00</u>
<i>Seventh Year.</i>		
Manager's salary.....	\$1,200 00	
Labor, 12 Japanese.....	2,160 00	
Picking, pulping, and drying 125,000 lbs. of coffee at 4 cents.	5,500 00	
Hulling, polishing, and grading 125,000 lbs. at 1 cent.....	1,250 00	
Sundries: bags, freight, etc.....	1,200 00	
	<u>\$11,310 00</u>	11,310 00
		<u>\$1,125 00</u>
<i>Credit.</i>		
By sale of 125,000 lbs. of coffee at 18 cents.....		22,500 00
Balance to credit of Plantation at end of seventh year.....		<u>\$21,275 00</u>

The yields as given in the above estimate are far below what may be attained by thorough cultivation and fertilizing. The coffee tree responds readily to good treatment, but will disappoint its owner if neglected.

CHAPTER V.

AGRICULTURAL POSSIBILITIES.

While the coffee trees are growing, and during the time that will elapse before the planter receives returns from his investment, it would be a wise thing for him to plant such things as will not only provide the greater part of the food for himself and family, but may also yield a moderate return in money. The soil and climate of the Hawaiian Islands will grow almost anything that grows in any other country. All northern fruits

can be grown if one will only go high enough on the mountain slopes of Maui and Hawaii. But the coffee planter must confine himself to such things as will thrive in the vicinity in which his coffee trees are planted, and it is for the information of intending planters that this chapter is written.

In the first place, almost all kinds of vegetables will grow in such profusion as will astonish those who have lived only in northern climes. Green and sweet corn, potatoes (Irish and sweet), cabbages, tomatoes, beans, lettuce, radishes, and many other kinds of vegetables, all of the finest quality and in the greatest profusion, can be had every day in the year. Strawberries and raspberries can also be had all the year round. In addition to oranges and limes, which grow to perfection in this country, many fruits peculiar to tropical and semi-tropical climates grow well and flourish in these Islands. Among the more important is the *Avocado Pear* (*Persea gratissima*), commonly called the Alligator Pear. This tree grows well and bears fruit of splendid quality in from 3 to 5 years from seed. The fruit is much esteemed by all classes. A small quantity of the fruit is shipped to California; what reaches there in good condition is quickly bought at high prices. It can only be carried safely in cold storage, and this is very expensive freight. A native peach does well, and will bear fruit in two years from seed. The fruit is much smaller than the American peach, (which, by the way, does not do well on elevations below 4,000 feet,) but very sweet and juicy, and makes excellent preserves and pies. Without doubt this peach could in a few years be improved so as to rival peaches of any other country. The Mango (*Mangifera Indica*) is a tropical fruit tree that grows in the greatest profusion, and bears enormous crops of delicious fruit. It comes into bearing in 5 or 6 years from seed, and does well from sea level to an elevation of 2,000 feet. The fruit is much liked by every one; the green fruit is made into a sauce resembling, but much superior to, apple butter.

The *Guava* (*Psidium Guayava*) grows wild in all parts of the Islands below 3,000 feet. The fruit, of which there is a great abundance, is made into jam and the very finest jelly in the world. In the fruiting season large quantities of the jelly can be made, and without doubt exported at a profit.

The *Poha* (*Physalis edulis*) is a quick-growing shrub bearing a berry that makes excellent jelly and jam. The shrub grows wild on elevations between 1,000 and 4,000 feet. A patch of pahas planted in a corner of a garden will grow and yield a bountiful supply of fruit almost without cultivation.

Pineapples are at home on these Islands; a small plot planted with the best varieties of this king of fruits will keep the table supplied the year round.

Another valuable fruit indigenous to this country is the *Papaia* (*Carica Papaya*). This fine fruit can be raised in enormous quantities, and is a most fattening food for pigs and chickens. The tree fruits in eight or nine months from the seed, and thenceforward for years it yields ripe fruit every month in the year. The fruit is of the size of a small melon and is very rich in sugar. The unripe fruit contains a milky juice that, even when diluted with water, renders any tough meat that is washed in it quite tender. A small piece of the unripe fruit placed in the water in which meat or tough chicken is boiled makes it tender and easily digestible.

A very valuable food plant, indigenous to these Islands, is the *Taro* (*Colocasia esculenta*). The variety known as dry-land taro will grow on

land that is moist enough for the coffee trees. The taro is a grand food plant, the tubers containing more nutriment for a given weight than any other vegetable food. The young tops when cooked are hard to distinguish from spinach. The tubers must be cooked before they can be used for food, in order to dissipate a very acrid principle that exists in both leaves and root.

Another important food plant that has been introduced and yields abundantly is the Cassava (*Manihot utilissima*). This plant furnishes the staple food for the population of Brazil. It is easily propagated by the planting pieces of the woody portions of the stems and branches. The tubers are available in nine or ten months after planting. There are two kinds, the sweet and the bitter, the latter being the more prolific. The sweet kind can be fed to pigs without cooking. The bitter kind contains a poisonous substance which is entirely destroyed by cooking. There is no danger of animals eating the bitter kind in a raw state, for no stock will touch it, while the sweet kind is eagerly eaten in the raw state by pigs, horses, cows, etc. The tubers are prepared for human food by grating them. The juice is then expelled by pressure, and the residue pounded into a coarse meal, which is made into thin cakes. It is an excellent food, and said to be much more digestible than bread and other foods made from wheat. Pigs can be very cheaply raised on the sweet variety of this plant. A field of the plant being ready to gather, a portion is fenced off, and the pigs turned into it. They will continue to feed until every vestige of the tubers is eaten, leaving the ground in a fine condition for replanting. The tubers never spoil in the ground; in fact the soil is the very best storehouse for them. However, if left for two or three years the tubers grow very large and tough. •

Bananas, in great variety, are grown in all parts of the Islands where there is sufficient moisture. Any land that will grow coffee will grow bananas. The yield of fruit from this remarkable plant is something astonishing. It commences to bear fruit in a little over one year from the time of planting. The stem decays after the formation of a bunch of fruit; this will weigh from 50 to 100 pounds and upwards. Numerous suckers spring up from around the decaying stem and bear fruit in their turn. One-half an acre planted with bananas would not only furnish a large family with an abundance of delicious and nutritious fruit, but would also yield a large supply of feed for pigs, chickens, and other stock.

The tea plant (*Camellia Thea*) grows well in this country and yields a tea of good quality. It is hardly likely that it will become an article of export from this country, as we cannot compete with the very low prices paid for labor in the great tea countries, India, Ceylon, and China. But it can be grown for home consumption, and there is no reason why every coffee planter should not have a patch of tea growing on his land. An eighth of an acre, planted out in tea plants, would yield more tea than could be consumed by a large family; the work of cultivation and preparation is light and easy, and could be done by women and children.

The coffee lands are situated in forested tracts in which there is little or no pasturage for animals. Every coffee planter should keep one or more cows to obtain the milk and butter which will furnish a large addition to the food supply for himself and family. In order to do this, it will be necessary to plant such things as will furnish food for the animals. We have several fodder plants that will yield a large quantity of feed, and which will only grow in tropical and semi-tropical countries.

First among these is the Teosinte Reana (*Euchloena luxurians*). This plant is a native of Guatemala, and grows splendidly in this country.

Each plant requires sixteen feet of ground for its full development. It is an annual if allowed to run to seed; but its growth can be continued by cutting when four or five feet high, and green feed obtained all the year round.

Guinea-grass (*Panicum maximum*), one of the grandest of fodder plants, has been introduced, and finds a congenial home in this country. It is purely a tropical grass; it grows to a height of eight feet, forming large bunches, which, when cut young, furnish an abundance of sweet and tender feed. In districts where there is sufficient moisture it can be cut every two months. Caffir corn, Egyptian millet, and sorghum grow well, and should be planted, in order to have a change of feed.

Pumpkins and squash grow to an enormous size and yield an immense quantity of feed, much relished by cows and pigs.

A dry-land rice is being tried in the coffee districts of Olaa and Kona, on the Island of Hawaii, and there is every reason to believe that it will be successful. Nearly all the laborers on the coffee plantations use rice as their staple food, and it has to be brought from the Island of Oahu to the Islands of Hawaii and Maui. There is no doubt but that the rice used by the labor on the coffee plantations can be raised on the spot, reducing the cost of living to the laborers, and making them more contented.

It will be seen from the foregoing that many things can be grown that will enable the coffee planter to not only reduce the outlay for living expenses for himself and family, but will also allow them to enjoy many of the comforts and luxuries of life.

While our main industries—sugar, coffee, and rice—are being vigorously carried on, new products are not lost sight of. Experiments are in progress that promise to greatly diversify our industries and increase the number of our exports.

Several fiber plants are receiving attention, particularly the Sisal hemp (*Agave Sisalana*) and *Sansevieria*, or bowstring hemp. The Sisal plant will grow and flourish on lands that are too dry for any other cultivation. Many thousands of the plants have been introduced, and at least one plantation is being set out.

The bowstring hemp requires a wet, rich land in order to do well. It probably yields the best fiber of all the leaf fiber plants.

Ramie (*Boehmeria nivea*) grows splendidly in this country, and after being well established will yield four to six crops per annum. Whenever a machine is invented that will economically decorticate the ramie fiber, its cultivation will become an important industry in this country. Ramie will grow and do well wherever the coffee tree will grow, and whenever the machine is available the coffee planter will have a profitable industry to go hand in hand with coffee and employ the slack time between the coffee-picking seasons.

Cocoa (*Theobroma Cacao*) is the tree that produces the fruit from which chocolate is made. It grows and bears well in moist, humid districts, and many of the coffee planters are setting out numbers of the trees.

There are many other economic plants that are well suited for culture in this country. The country is entering on a new era, and as the lands become settled and population increases many small cultures will become possible, which will afford many persons the opportunity of making an easy living in a land of eternal summer.

CHAPTER VI.

DIGEST OF THE LAND ACT OF 1895.

(With reference to unoccupied lands.)

The Land Act of 1895, having for its special object the settlement and cultivation of the Government agricultural and pastoral land, vested the control and management of Public Lands in a Board of three Commissioners, composed of the Minister of the Interior and two persons appointed and removable by the President, one of whom is designated the Agent of Public Lands; but excepting from the control of the Commissioners town lots, landings, tracts reserved for public purposes, etc., which remain under the control of the Minister of the Interior.

For the purposes of the Act, the Republic of Hawaii is divided into Six Land Districts, as follows :

- 1st. Hilo and Puna, on the Island of Hawaii.
- 2d. Hamakua and Kohala, on the Island of Hawaii.
- 3rd. Kona and Kau on the Island of Hawaii.
- 4th. The Islands of Maui, Molokai, Lanai, and Kahoolawe.
- 5th. The Island of Oahu.
- 6th. The Island of Kauai.

The Commissioners are represented by a Sub-Agent in each District.

Public Lands, for the purposes of this Act, are classified as follows :

I. Agricultural Lands. First class : Land suitable for the cultivation of Fruit, Coffee, Sugar or other perennial crops with or without irrigation.

Second class : Land suitable for the cultivation of annual crops only.

Third class : Wet lands, such as kalo and rice lands.

II. Pastoral Land. First class : Land not in the description of Agricultural land but capable of carrying live-stock the year through.

Second class : Land capable of carrying live-stock only part of the year, or otherwise inferior to First Class Pastoral land.

III. Pastoral Agricultural Land. Land adapted in part for pasturage and in part for cultivation.

IV. Forest Land. Land producing forest trees but unsuitable for cultivation.

V. Waste Land. Land not included in the other classes.

The Act provides three principal methods for the acquirement of Public Lands, under systems known as—

- I. Homestead Lease.
- II. Right-of-Purchase Lease.
- III. Cash Freehold.

GENERAL QUALIFICATION OF APPLICANTS.

Applicants for land under systems named above must be over eighteen years of age, must be citizens by birth or naturalization or have received letters of denization or special rights of citizenship, be under no civil disability for any offense, nor delinquent in the payment of taxes. Special qualifications are named under the respective systems.

HOMESTEAD-LEASE SYSTEM.

The Homestead-Lease system permits the acquirement of Public Land by qualified persons without other payments than a fee of two dollars upon application and a fee of five dollars upon issuance of Homestead Lease.

The limit of area in the different classes of land which may be acquired under Homestead Lease is :

8 acres first-class agricultural land ;
 16 acres second-class agricultural land ;
 1 acre wet (rice or taro) land ;
 30 acres first-class pastoral land ;
 60 acres second-class pastoral land ;
 45 acres pastoral-agricultural land.

SPECIAL QUALIFICATIONS OF APPLICANTS FOR HOMESTEAD LEASE.

Any person having the general qualifications (as to citizenship, etc.) who is not the owner in his own right of any land in the Hawaiian Islands, other than "wet land" (rice, taro, etc.), and who is not an applicant for other land under the Act, may apply under this part of the Act, and such application may cover one lot of wet land in addition to other land, if reasonably near. Husband and wife may not both be applicants.

Applications must be made in person at the office of Sub-Agent of the District, accompanied by sworn declaration of qualifications, and a fee of \$2.

CERTIFICATE OF OCCUPATION.

The successful applicant receives a certificate of occupation which entitles him to occupy the described premises and to receive a homestead lease for Nine Hundred and Ninety-Nine Years, if conditions of certificate of occupation have been fulfilled, the conditions being:

That the occupier shall, before the end of two years, build a dwelling-house and reside on the premises. He shall maintain his home on the premises from and after the end of two years from date of certificate. He shall before the end of six years from date of certificate have in cultivation not less than 10 per cent. of the land, or have in cultivation 5 per cent. of the land, and, in good growing condition, not less than ten timber, shade, or fruit trees per acre on agricultural land, or, if pastoral land, fence the same within six years.

He shall pay the taxes assessed upon the premises within sixty days after the same are delinquent.

He shall perform any conditions of the certificate for the planting or protection of trees, or prevention or destruction of vegetable pests that may be on the premises.

CONDITIONS OF HOMESTEAD LEASE.

The lessee or his successors must maintain his home on the leased premises, must pay the taxes assessed upon the premises, within sixty days after the same are delinquent, and perform any conditions of the lease relating to protection or planting of trees, or destruction and prevention of vegetable pests.

Lands held under a certificate of occupation or homestead lease are liable to taxation as estates in fee.

In case of the death of an occupier or lessee, his interests, notwithstanding any devise or bequest, shall vest in his relations, in the order prescribed in the Act, the widow or widower being first in order, then the children, etc.

Certificates of occupation or homestead leases, or any interest thereunder, are not assignable by way of mortgage nor are the same subject to attachment, levy, or sale on any process issuing from the Courts of the country. Neither the whole nor any portion of the premises may be sub-let.

Surrender may be made to the Government by an occupier or lessee having the whole interest if all conditions to date of surrender have been fulfilled, and the person so surrendering is entitled to receive from the

Government the value of permanent improvement, whenever the same is received by the Government from a new tenant.

RIGHT-OF-PURCHASE LEASES.

Right-of-Purchase Leases, for the term of twenty-one years, may be issued to qualified applicants, with the privilege to the Lessee of purchasing at the end of three years and upon fulfillment of special conditions.

QUALIFICATIONS OF APPLICANTS.

Any person who is over eighteen years of age, who is a citizen by birth or naturalization of the Republic of Hawaii or who has received letters of denization of special rights of citizenship, who is under no civil disability for any offense, who is not delinquent in the payment of taxes, and who does not own any agricultural or pastoral land in the Hawaiian Islands, may apply for Right-of-Purchase Lease, the limit of areas which may be acquired being:

- 100 acres first-class agricultural lands ;
- 200 acres second-class agricultural land ;
- 2 acres wet (rice or taro) land ;
- 600 acres first-class pastoral land ;
- 1,200 acres second-class pastoral land ;
- 400 acres mixed agricultural and pastoral land.

Any qualified person, owning less than the respective amounts stated in foregoing list, and which is not subject to residence condition, may acquire additional land of the classes already held by him, but so that his aggregate holding shall not be in excess of the limit named ; or, if desiring additional land of another class, may acquire the same according to ratio established between the various classes.

Husband and wife may not both be applicants for Right-of-Purchase Leases.

Application must be made in person at the office of Sub-Agent of the District, and must be accompanied by a fee equal to six months' rent of premises, fee to be credited on account of rent if application is successful, and to be returned if application is unsuccessful. In case of more than one application for same lot, the first application takes precedence.

CONDITIONS OF RIGHT-OF-PURCHASE LEASE.

Term : twenty-one years.

Rental : Eight per cent. on the appraised value given in lease, payable semi-annually.

The Lessee must from the end of the first to the end of the fifth year continuously maintain his home on the leased premises.

The Lessee must have in cultivation at the end of three years five per cent. and at the end of five years ten per cent. of his holding, and maintain on agricultural land an average of ten trees to the acre.

Pastoral land must be fenced.

Interest in Right-of-Purchase Lease is not assignable without written consent of the Commissioners of Public Lands, but the lease may be surrendered to the Government.

In case of forfeiture or surrender of Right-of-Purchase Lease, reappraisement is made of the land and of permanent improvements thereon, and if the land is again disposed of, the incoming tenant shall pay for such permanent improvements, and the amount when so received by the Government shall be paid to the surrendering Lessee.

CONDITIONS UNDER WHICH PURCHASE MAY BE MADE.

At any time after third year of leasehold term, the Lessee is entitled to a Land Patent giving fee-simple title, upon his payment of the appraised

value set forth in lease, if he has reduced to cultivation twenty-five per cent. of his leased premises, and has substantially performed all other conditions of his lease.

CASH FREEHOLDS.

Cash Freehold Lots are sold at auction to the highest qualified bidder at appraised value as upset price.

The qualification of applicants for Cash Freeholds and the areas of land which may be acquired are the same as those under Right-of-Purchase Lease system.

APPLICATIONS.

Applications must be made to Sub-Agent of District in writing with sworn declaration as to qualifications, and a fee of ten per cent. of appraised value of lot, which fee is forfeited if applicant declines to take the premises at the appraised value, and is credited to him if he becomes the purchaser of the lot. If such applicant, however, is outbid, his fee is returned to him.

If two or more applications are made, and there is no bid above the upset price, the first application takes precedence.

The purchaser at auction sale must pay immediately thereafter one-fourth of purchase price, and thereupon receive a "Freehold Agreement."

CONDITIONS OF FREEHOLD AGREEMENT.

The freeholder shall pay the balance of purchase price in equal installments in one, two, and three years, with interest at 6 per cent., but may pay any installment before it is due and stop corresponding interest.

Twenty-five per cent. of agricultural land must be cultivated, and pastoral land fenced before the end of third year.

Freeholder must maintain his home on the premises from end of first to end of third year.

He may not assign or sub-let without consent of Agent of Public Lands.

He must allow Agents of the Government to enter and examine the premises.

He must pay all taxes that may be due upon the premises.

If all conditions are fulfilled he is entitled at the end of three years to Patent giving fee-simple title.

In case of forfeiture or surrender the land and permanent improvements are re-appraised separately, and the value of such improvements, when received by Government from new tenant or freeholder, will be paid to surrendering freeholder.

SETTLEMENT ASSOCIATIONS.

Six or more qualified persons may form a "Settlement Association" and apply for holdings in one block.

The provisions for cash freehold apply to the settlement of such blocks, but first auction sale is confined to members of such Settlement Association.

Any lot in such block which may be forfeited or surrendered, or which is not taken up by any member of the Settlement Association within three months, shall be open to any qualified applicants.

Disputes, disagreements, or misunderstandings between the parties to certificate of occupation, homestead lease, right-of-purchase lease, or cash freehold, and relating thereto, which cannot be amicably settled, shall be submitted to the Circuit Judge in whose jurisdiction the premises are situated, and his decision shall be final, subject only to appeal to Supreme Court.

CASH SALES AND SPECIAL AGREEMENTS.

With consent of Executive Council, public lands not under lease may be sold in parcels of not over one thousand acres at public auction, for cash, and upon such sale and payment of full consideration a land patent will issue.

Parcels of land of not over six hundred acres may, with consent of Executive Council, be sold at public auction, upon part credit and part cash, and upon such terms and conditions of improvement, residence, etc., as may be imposed.

Upon fulfillment of all conditions a Land Patent will issue.

GENERAL LEASES.

General leases of public lands may be made for a term not exceeding twenty-one years.

Such leases are sold at public auction, and require rent in advance quarterly, semi-annually, or annually.

The conditions of general leases are made at discretion of the Commissioners, and may be made for any class of public lands.

CHAPTER VII.

Miscellaneous.

POPULATION.

The population of the Islands according to the census of 1890 was 89,991, or in round numbers 90,000. A census of the population has just been taken, but the results cannot be exactly known for some months. An estimate recently made, based upon the knowledge of general increase from various sources, gives the population as follows:

Hawaiians.....	35,000
Part Hawaiians.....	10,000
Chinese.....	15,000
Japanese.....	24,000
Portuguese.....	9,000
American and European.....	14,000

Total..... 107,000

Since the census returns began to come in, it is very evident that this estimate will be exceeded by some 2,000, making the total population 109,000. The increase will probably be found among Japanese and Portuguese. The population of Honolulu is 29,920, or practically 30,000.

SHIPPING.

The vessels flying the Hawaiian flag number 52, aggregating 21,678 tons. They are divided as follows:

23 steamers, aggregating.....	9,575 tons
5 barks, ".....	4,198 "
3 ships, ".....	6,272 "
21 schooners and sloops, aggregating.....	1,623 "

Of these vessels 13 are employed in foreign trade and 39 in trade between the Islands.

FINANCES.

Mention has been made of the taxes of this country. A few words will be to the point upon the financial condition of the Government.

The direct taxes yielded in 1895 \$592,691.92. The customs revenue was \$547,149.04, and licenses, &c., produced \$600,224.23; in all, \$1,740,065.19.

The current expenditures are kept within the current income. Great public improvements are provided for by loan. This is what every growing country has to do. The public debt of the country on January 1, 1896, was \$3,764,335. With a population of 109,000, this gives about \$34 per head of the population. The Hawaiian Government finds no difficulty in obtaining means for internal improvements, and a scheme is now on foot to reduce the interest and consolidate the public debt.

The exports in 1895 amounted to \$8,474,138.15, and the imports to \$5,339,785.04. This certainly shows well for a country whose total population is exceeded by dozens of cities. Of the exports, \$7,975,590.41 was accredited to sugar, \$22,823.68 to coffee, \$102,599.25 to bananas, and \$8,783.84 to pineapples. These three latter items are elastic, and the showing of 1896 will give a very large increase in their yields.

Of the imports, \$4,121,920.22 came from the Pacific ports of the United States, and \$394,399.16 from the Atlantic ports, a total of \$4,516,319.38, leaving but \$1,197,698.16 for every other nation that the country has commercial relations with.

In point of fact, taking exports and imports, the business in 1895 done by the Hawaiian Islands, with all their commercial relations, amounted to \$14,188,155.69; of this sum, \$12,908,508.92 was done with the United States, which amounts to 91 per cent. of the whole business of the Islands. From these figures it can be judged how prosperous a little community that of the Hawaiian Islands is, and, further, how close are its relations with the great republic. What country in the world has 91 per cent. of its commercial relations with its neighbor?

The financial condition of Hawaii is on a sound basis. The men in charge of its government are frugal and careful of the public expenditure; the whole tendency of the Republic is to foster industry and thrift. The institutions are liberal, and nothing is more desirable for such a country than the immigration of colonists with capital to develop the industries and with the determination to work honestly and well.

FOR TOURISTS.

It was not the intention, when planning this pamphlet, to speak of the opportunities for tourists visiting the Islands, but a few words are appended. The object of the pamphlet has been to show the agricultural resources and general conditions.

The great attraction of the Islands is undoubtedly the Volcano of Kilauea, the greatest and most striking volcano in the world. Though quiescent for a time during part of 1895 and 1896, it has now burst forth with renewed splendor, and promises to exceed many of its former efforts. Moreover, from the rising of the lakes of fire, and the floor of the crater generally, it has evidently come to stay.

But it is not only this one great natural wonder that is attractive to the tourist. The crater of Haleakala, the largest extinct crater in the world, is almost, in its silent magnificence, equal to the wonder of the boiling and seething Kilauea. Then the delightful climate, the balmy breezes, the brilliant coloring of sky, sea, and land, the luxuriant tropical vegetation, and the peculiar "dolce far niente" life, all lend a charm to which

no one who visits the place has ever failed to respond. In fact a visit to the Hawaiian Islands is one of the pleasantest experiences of a lifetime.

For people suffering from pulmonary troubles the climate is unrivalled and there are now several sanitariums where such patients can be attended to.

San Francisco and Victoria are the two points of deportation for the Hawaiian Islands. The Oceanic Steamship Line has vessels sailing twice a month. One steamer sails for Honolulu, stays a few days, and returns to San Francisco. The other steamers touch at Honolulu and go on to the Australian colonies. Round-trip tickets can be obtained, and also lay-over tickets, at the Company's offices on Montgomery street, San Francisco. The Pacific Mail and O. & O. S. S. lines, running from China and Japan to San Francisco, also touch at Honolulu regularly. Arrangements can be made to lay over in Honolulu, visit the Volcano, and proceed on the voyage by the next vessel.

From Victoria the C. & A. S. S. sail once a month. They give the tourist a chance of seeing the Canadian Pacific Railroad before coming here, but a round-trip ticket would have to be for a full month. By the O. S. S. lines less time need be spent on the Islands.

The cost of round-trip passage is \$125.

The cost of trip to the Volcano, including all expenses, is \$50.

Hotel expenses in Honolulu from \$2 a day, according to accommodation.

Particulars on these subjects can always be learned by writing to Wilder S. S. Co., Fort street, Honolulu; or the Inter-Island Steamship Co., Queen street, Honolulu.

PRICE LIST OF PROVISIONS ON THE HAWAIIAN ISLANDS.

Fresh Hawaiian butter, from 25 to 50c. per lb.
 Hams, from 16½ to 30c. per lb.
 Bacon, from 16½ to 20c. per lb.
 Cheese, from 20 to 35c. per lb.
 Family pork, from 15 to 18c. per lb.
 Corned beef, 7c. per lb.
 Fresh meat, from 6 to 15c. per lb.
 Loin of porterhouse steaks, from 6 to 15c. per lb.
 Tin fruits per doz., from \$1.75 to \$2.25.
 Golden Gate flour, per 100 lbs., \$2.50.
 Lower grades, \$2.20.
 Hawaiian rice, \$3.25 to \$5.00 per 100 lbs.
 Hawaiian bananas, per bunch, 25 to 55c.
 Potatoes, from 1 to 2c. per lb.
 Eggs per dozen, 25 to 50c.
 Rolled oats per case, \$5.50.
 Ice, in small quantities, 1½c.; 50 lbs. and over, 1c. per lb.

WAGES.

The following is an approximation of the wages paid to different classes of labor on the Hawaiian Islands:

Engineers on plantations, from \$125 to \$175 per month, house and firewood furnished.

Sugar boilers, \$125 to \$175 per month, house and firewood furnished.

Blacksmiths, plantation, \$50 to \$100 per month, house and firewood furnished.

Carpenters, plantation, \$50 to \$100 per month, house and firewood furnished.

Locomotive drivers, \$40 to \$75 per month, room and board furnished.

Head overseers, or head lunas, \$100 to \$150.

Under overseers, or lunas, \$30 to \$50, with room and board.

Bookkeepers, plantation, \$100 to \$175, house and firewood furnished.

Teamsters, white, \$30 to \$40, with room and board.

Hawaiians, \$25 to \$30, with room; no board.

Field labor, Portuguese and Hawaiian, \$16 to \$18 per month; no board.

Field labor, Chinese and Japanese, \$12.50 to \$15 per month; no board.

In Honolulu bricklayers and masons receive from \$5 to \$6 per day; carpenters, \$2.50 to \$5; machinists, \$3 to 5; painters, \$2 to \$5 per day of nine hours.

DOMESTIC LABOR.

The domestic labor in Honolulu and in all parts of the Islands has for many years been performed by Chinese males, who undoubtedly make excellent house servants. During the last four or five years the Japanese have entered the field; the Japanese women are especially in demand as nurses for children.

The following are the prevailing rates of wages :

Cooks, Chinese and Japanese, \$3 to \$6 per week, with board and room.

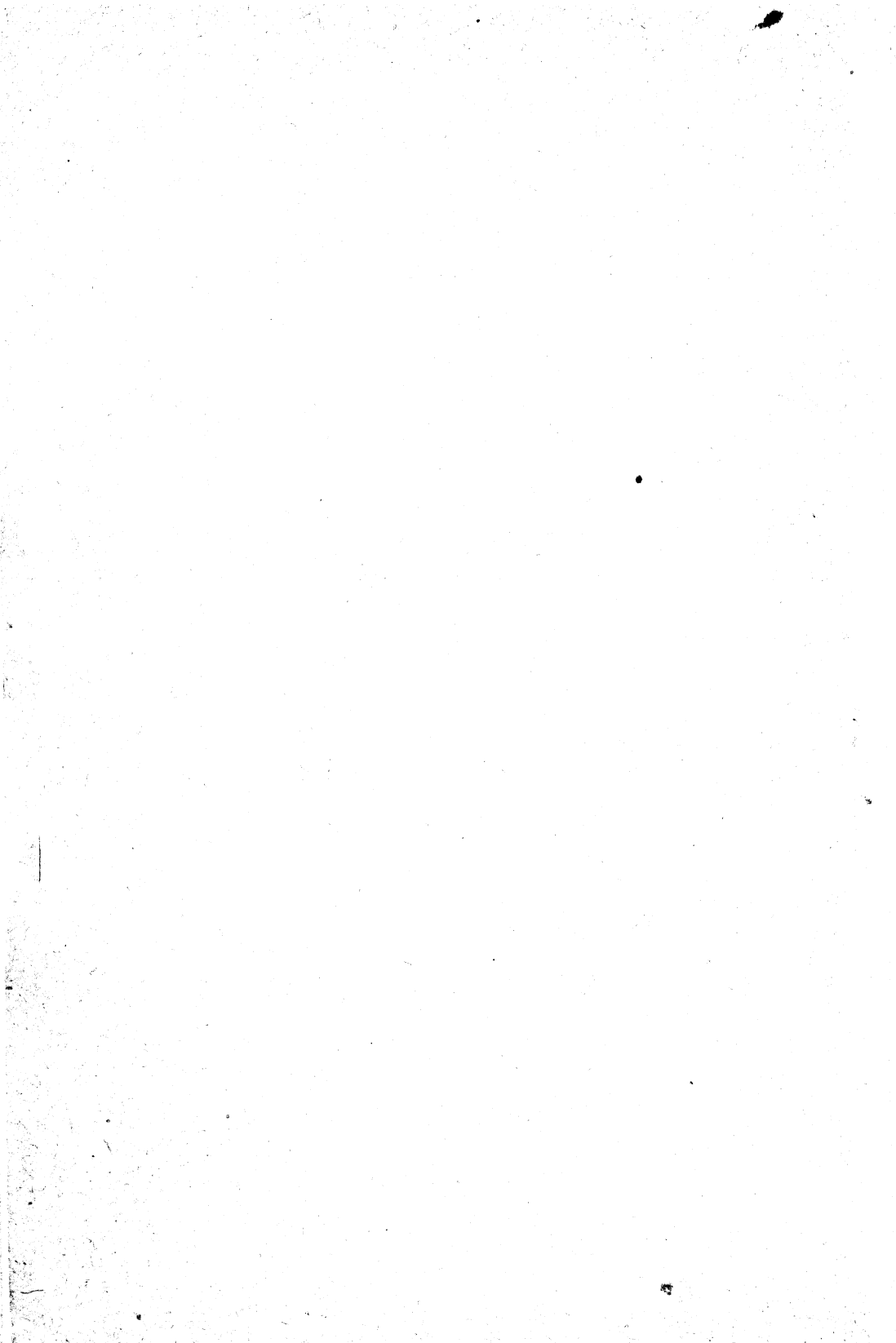
Nurses and house servants, \$8 to \$12 per month, with board and room.

Gardeners or yard men, \$8 to \$12 per month, with board and room.

Sewing women, \$1 per day and one meal.

Good substantial meals can be obtained at respectable Chinese restaurants and at the Sailors' Home for 25 cents, or board for \$4.50 per week.

The market for all kinds of labor is overstocked, and it would be very unwise for any one to come to these Islands with no capital on the mere chance of obtaining employment. The many steamships arriving at this port bring numbers of people seeking employment who are obliged to return disappointed.



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